

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the broadcast system in a train which used the radio telephone equipment for the detail about the broadcast system in a train.

[0002]

[Description of the Prior Art] Conventionally, information guidance in a train was performed with voice by the public address system in the car to which the conductor patrolled the inside of a train, and transmitted by oral, or a conductor's room and the loudspeaker equipment of each train were connected.

[0003] However, with the voice which an informational supplement does not hear, there was a case where it failed to hear important information. So, recently, information guidance in an alphabetic character is performed by the display installed in the car.

[0004] For example, there is an in-the-car information guidance system indicated by JP,61-285490,A to display such information. This in-the-car information guidance system distributes the image information data for performing information broadcast in the train which edited into the indicating equipment prepared in each car with the information processor from sending-out equipment, and carries out display broadcast of the stop [degree] name of the station etc. with an indicating equipment within the train under operation. And it is usually that such a display is prepared good [the entrance of one side of each train or both sides].

[0005] Moreover, conventionally, between a stop and a shuttle bus and between a stop and a bus-office are communicated bidirectionally on radio, the operation situation of a shuttle bus is displayed on a stop, or the shuttle bus operation information system managed at a bus office is proposed (refer to JP,8-185597,A).

[0006] In this shuttle bus operation information system, it is carried out by reproducing a tape etc. and broadcasting from the loudspeaker currently installed in the bus as communication with a bus and a stop is performed by transmitting an electric-wave signal which is different according to a destination from a bus side and operation guidance to the PAX in a bus is performed from the former.

[0007]

[Problem(s) to be Solved by the Invention] However, if it was in the in-the-car information guidance system given [above-mentioned] in JP,61-285490,A, since various information was displayed on the display prepared good [the entrance in a train], for the PAX of a location distant from the case where in the car is crowded, or a display, or the PAX with weak eyesight, there was a problem that it was inadequate when it is difficult to check information by looking or it transmits information appropriately by broadcast in

the car.

[0008] Moreover, if it is in a shuttle bus operation information system given [above-mentioned] in JP,8-185597,A Since the operation situation of a shuttle bus was displayed on the stop by transmitting an electric-wave signal which is different according to a destination from a bus side, while there is the same problem as the above-mentioned former also in this case In order to play a tape etc. and to broadcast the following stop name with voice to the PAX in a bus, for the inconvenient person of hearing, it is difficult for information to come to hand, and there was a problem that it was inadequate when transmitting information appropriately by broadcast in the car.

[0009] Then, invention according to claim 1 outputs to the base station in a train where the main base station carried in the train was carried in each passenger car considering train guidance information, such as an operation situation of a train, as guidance information which consists of text data. While each base station in a train transmits guidance information into a passenger car by the digital radio electric wave, and the radio telephone equipment in a passenger car receives the digital radio electric wave of this guidance information, changes the guidance information concerned into text and displaying on a display The information receiving station outside a train detects the wireless electric wave outside a train of the same frequency band as the wireless electric wave which the base station in a train transmits, and measures the field strength. When a control means controls the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the wireless electric wave outside a train concerned While displaying on the radio telephone equipment with which the PAX in a passenger car is carrying the guidance information which consists of text data in an alphabetic character etc. and transmitting train guidance information, such as an operation situation of a train, suitable for the PAX In case it passes through the area where a train may generate wireless failures, such as an area with much traffic, and a residential street Based on the field strength of the wireless electric wave outside a train, the output level of the digital radio electric wave transmitted from each base station in a train is controlled automatically. Guidance information is received by the radio telephone equipment besides a train, and it prevents that unnecessary information flows to the radio telephone equipment besides a train, or aims at offering the broadcast system in a train which prevents doing a wireless failure to the radio telephone equipment besides a train etc.

[0010] While invention according to claim 2 outputs train guidance information, such as an operation situation of a train, to the base station in a train carried in each passenger car as guidance information which consists of text data from the main base station carried in the train The main base station which transmitted the station guidance information about the station concerned to the train within predetermined distance from the station base station installed in each station, and was carried in the train in the information receiving station outside a train Detect the wireless electric wave outside a train of the same frequency band as the wireless electric wave which the base station in a train transmits, and the field strength is measured. Establish the base station and link of the highest wireless electric wave outside a train of the field strength concerned, check the ID, and a

control means compares the ID concerned with ID of a station base station. If in agreement, will receive the wireless electric wave outside a train concerned, and station guidance information will be acquired. The main base station outputs this station guidance information to the base station in a train carried in each passenger car as guidance information which consists of text data. Each base station in a train transmits the guidance information on station guidance information and train guidance information into a passenger car by the digital radio electric wave, and the radio telephone equipment in a passenger car receives the digital radio electric wave of this guidance information. While changing the guidance information concerned into text and displaying on a display, when ID of the base station of the wireless electric wave outside a train is ID and the inequality of a station base station By controlling the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the wireless electric wave outside a train which the control means measured The guidance information which is train guidance information and station guidance information is displayed on the radio telephone equipment which the PAX in a passenger car is carrying in an alphabetic character etc. While transmitting guidance information including which station the train guidance information and the trains of a train, such as an operation situation, have approached, and station guidance information suitable for the PAX In case it passes through the area where a train may generate wireless failures, such as an area with much traffic, and a residential street Based on the field strength of the wireless electric wave outside a train, the output level of the digital radio electric wave transmitted from each base station in a train is controlled automatically. Guidance information is received by the radio telephone equipment besides a train, and it prevents that unnecessary information flows to the radio telephone equipment besides a train, or aims at offering the broadcast system in a train which prevents doing a wireless failure to the radio telephone equipment besides a train etc.

[0011] Invention according to claim 3 by transmitting station guidance information by the wireless electric wave of the frequency band where a station base station differs from the frequency band of the wireless electric wave which the base station in a train transmits The output level of the wireless electric wave which the base station in a train transmits only based on the field strength of the wireless electric wave outside a train of the same frequency band as the frequency band of the wireless electric wave which the base station in a train transmits is controlled. Further that guidance information is received by the radio telephone equipment besides a train, and unnecessary information flows to the radio telephone equipment besides a train Appropriateness, And it prevents cheaply or aims at offering the broadcast system in a train which prevents much more appropriately and cheaply doing a wireless failure to the radio telephone equipment besides a train etc.

[0012] Invention according to claim 4 receives the wireless electric wave outside a train of two or more frequency bands. Establish the base station and link of the wireless electric wave concerned, check the ID, and the ID concerned is compared with ID of the station base station registered beforehand. When in agreement and ID of the wireless electric wave outside a train which received the wireless electric wave concerned, acquired station guidance information, and received is ID and the inequality of a station base station By controlling the output level of the wireless electric wave which the base

station in a train transmits according to the field strength of the measured wireless electric wave outside a train. It aims at offering the broadcast system in a train which prevents appropriately doing a wireless failure to the radio telephone equipment besides the train using the wireless electric wave of a larger frequency band etc.

[0013]

[Means for Solving the Problem] The broadcast system in a train of invention according to claim 1. The base station in a train of a train which is installed in each passenger car at least, and transmits a digital wireless electric wave. The main base station which is connected to the base station in said train, and outputs train guidance information, such as an operation situation of said train, to the base station in said train as guidance information which consists of text data. While having a predetermined display, receiving a digital radio electric wave, changing that the wireless electric wave concerned is text data into text and carrying out a display output to said display. It has the radio telephone equipment in which the message which used said digital radio electric wave is possible. Said main base station outputs said train guidance information to each [said] base station in a train as said guidance information which consists of said text data. Each [said] base station in a train transmits the guidance information concerned into said passenger car by said wireless electric wave. Said radio telephone equipment in said passenger car receives said wireless electric wave of said guidance information transmitted from the base station in said train. It is the broadcast system in a train which changes the guidance information concerned into text and is displayed on said display. Said main base station. The wireless electric wave outside a train of the same frequency band as said wireless electric wave which the base station in said train transmits is detected. The above-mentioned purpose is attained by having the control means which controls the output level of said wireless electric wave which the base station in said train transmits according to the field strength of said wireless electric wave outside a train which the information receiving station outside a train which measures the field strength, and said information receiving station outside a train measured.

[0014] According to the above-mentioned configuration, the main base station carried in the train outputs train guidance information, such as an operation situation of a train, to the base station in a train carried in each passenger car as guidance information which consists of text data. While each base station in a train transmits guidance information into a passenger car by the digital radio electric wave, and the radio telephone equipment in a passenger car receives the digital radio electric wave of this guidance information, changes the guidance information concerned into text and displaying on a display. The information receiving station outside a train detects the wireless electric wave outside a train of the same frequency band as the wireless electric wave which the base station in a train transmits, and measures the field strength. Since a control means controls the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the wireless electric wave outside a train concerned. While being able to display on the radio telephone equipment with which the PAX in a passenger car is carrying the guidance information which consists of text data in an alphabetic character etc. and being able to transmit train guidance information, such as an operation situation of a train, suitable for the PAX. In case it passes through the area where a train may

generate wireless failures, such as an area with much traffic, and a residential street. Based on the field strength of the wireless electric wave outside a train, the output level of the digital radio electric wave transmitted from each base station in a train is controlled automatically. It can prevent that guidance information is received by the radio telephone equipment besides a train, and unnecessary information flows to the radio telephone equipment besides a train, or can prevent doing a wireless failure to the radio telephone equipment besides a train etc.

[0015] The broadcast system in a train of invention according to claim 2. The station base station which is installed in each station and transmits the station guidance information about each station concerned, such as a name of the station of each station concerned, to the train within predetermined distance by the wireless electric wave from the station concerned at least, The base station in a train of said train which is installed in each passenger car at least, and transmits a digital wireless electric wave, While outputting to the base station in said train as guidance information which is connected to the base station in said train, and consists train guidance information, such as an operation situation of said train, of text data. The main base station outputted to the base station in said train as said guidance information which receives said station guidance information by said wireless electric wave from said station base station, and consists of text data, While having a predetermined display, receiving a digital radio electric wave, changing that the wireless electric wave concerned is text data into text and carrying out a display output to said display. While it has the radio telephone equipment in which the message which used said digital radio electric wave is possible and said main base station outputs said train guidance information to each [said] base station in a train as said guidance information which consists of said text data. If said station guidance information by said wireless electric wave is received from said station base station. The station guidance information concerned is outputted to each [said] base station in a train as said guidance information which consists of said text data. Each [said] base station in a train transmits the guidance information concerned into said passenger car by said wireless electric wave. Said radio telephone equipment in said passenger car receives said wireless electric wave of said guidance information transmitted from the base station in said train. It is the broadcast system in a train which changes the guidance information concerned into text and is displayed on said display. Said main base station. The wireless electric wave outside a train of the same frequency band as said wireless electric wave which the base station in said train transmits is detected. Measure the field strength and the base station and link of said highest wireless electric wave outside a train of the field strength concerned are established. Said ID which the information receiving station outside a train which checks the ID, and said information receiving station outside a train checked is compared with ID of said station base station registered beforehand. If in agreement, receive the wireless electric wave outside a train concerned, acquire said station guidance information, and when said acquired ID is ID and the inequality of said station base station. The above-mentioned purpose is attained by having the control means which controls the output level of said wireless electric wave which the base station in said train transmits according to the field strength of said measured wireless electric wave outside a train.

[0016] While outputting train guidance information, such as an operation situation of a train, to the base station in a train carried in each passenger car as guidance information which consists of text data from the main base station carried in the train according to the above-mentioned configuration The main base station which transmitted the station guidance information about the station concerned to the train within predetermined distance from the station base station installed in each station, and was carried in the train in the information receiving station outside a train Detect the wireless electric wave outside a train of the same frequency band as the wireless electric wave which the base station in a train transmits, and the field strength is measured. Establish the base station and link of the highest wireless electric wave outside a train of the field strength concerned, check the ID, and a control means compares the ID concerned with ID of a station base station. If in agreement, will receive the wireless electric wave outside a train concerned, and station guidance information will be acquired. The main base station outputs this station guidance information to the base station in a train carried in each passenger car as guidance information which consists of text data. Each base station in a train transmits the guidance information on station guidance information and train guidance information into a passenger car by the digital radio electric wave, and the radio telephone equipment in a passenger car receives the digital radio electric wave of this guidance information. While changing the guidance information concerned into text and displaying on a display, when ID of the base station of the wireless electric wave outside a train is ID and the inequality of a station base station Since the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the wireless electric wave outside a train which the control means measured is controlled The guidance information which is train guidance information and station guidance information is displayed on the radio telephone equipment which the PAX in a passenger car is carrying in an alphabetic character etc. While being able to transmit guidance information including which station the train guidance information and the trains of a train, such as an operation situation, have approached, and station guidance information suitable for the PAX In case it passes through the area where a train may generate wireless failures, such as an area with much traffic, and a residential street Based on the field strength of the wireless electric wave outside a train, the output level of the digital radio electric wave transmitted from each base station in a train is controlled automatically. It can prevent that guidance information is received by the radio telephone equipment besides a train, and unnecessary information flows to the radio telephone equipment besides a train, or can prevent doing a wireless failure to the radio telephone equipment besides a train etc.

[0017] Said station base station may transmit said station guidance information by the wireless electric wave of a different frequency band from the frequency band of said wireless electric wave which the base station in said train transmits so that it may indicate at claim 3 in the above-mentioned case.

[0018] Since station guidance information is transmitted by the wireless electric wave of the frequency band where a station base station differs from the frequency band of the wireless electric wave which the base station in a train transmits according to the above-mentioned configuration The output level of the wireless electric wave which the base

station in a train transmits only based on the field strength of the wireless electric wave outside a train of the same frequency band as the frequency band of the wireless electric wave which the base station in a train transmits is controlled. Guidance information is received by the radio telephone equipment besides a train, and it can prevent much more appropriately and cheaply that unnecessary information flows to the radio telephone equipment besides a train, or can prevent much more appropriately and cheaply doing a wireless failure to the radio telephone equipment besides a train etc.

[0019] For example, so that it may indicate to claim 4 moreover, said information receiving station outside a train The wireless electric wave outside a train of two or more frequency bands is received, the base station and link of the wireless electric wave outside a train concerned are established, and the ID is checked. Said control means If in agreement as compared with ID of said station base station registered beforehand, the ID concerned Receive the wireless electric wave outside a train concerned, acquire said station guidance information, and when said ID of the wireless electric wave outside a train which received is ID and the inequality of said station base station The output level of said wireless electric wave which the base station in said train transmits according to the field strength of said measured wireless electric wave outside a train may be controlled.

[0020] According to the above-mentioned configuration, the wireless electric wave outside a train of two or more frequency bands is received. Establish the base station and link of the wireless electric wave concerned, check the ID, and the ID concerned is compared with ID of the station base station registered beforehand. When in agreement and ID of the wireless electric wave outside a train which received the wireless electric wave concerned, acquired station guidance information, and received is ID and the inequality of a station base station Since the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the measured wireless electric wave outside a train is controlled, it can prevent appropriately doing a wireless failure to the radio telephone equipment besides the train using the wireless electric wave of a larger frequency band etc.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of suitable operation of this invention is explained to a detail based on an accompanying drawing. In addition, since the gestalt of the operation described below is a gestalt of suitable operation of this invention, desirable various limitation is attached technically, but especially the range of this invention is not restricted to these modes, as long as there is no publication of the purport which limits this invention in the following explanation.

[0022] Drawing 1 is the system configuration Fig. of the broadcast system 1 in a train which applied the gestalt of operation of the 1st of the broadcast system in a train of this invention.

[0023] The station base station where the broadcast system 1 in a train was installed in each station in drawing 1 (illustration abbreviation), The main base station 3 carried in

the conductor car M1 the conductor of a train 2 gets into [car], It has the digital migration terminal 4 grade which the passenger cars M2 and M3 the PAX of the conductor car M1 and a train 2 gets into [passenger cars], the base stations P1 and P2 in the train carried in ..., respectively, ... and the conductor car M1, each passenger cars M2 and M3, and the PAX that gets into [...] carry.

[0024] The station base station is installed in each station of the operation route of a train 2, is equipped with the storage which memorizes station guidance information, such as a name of the station of the station concerned, as text data, and transmits the above-mentioned station guidance information memorized by storage by the feeble wireless electric wave which can be transmitted only into predetermined point-blank range (microcell) to the train 2 by which ID registration is carried out beforehand.

[0025] The main base station 3 is carried in the conductor car M1 of a train 2, and is equipped with the mobile station 5 for information reception, the information processor 6, and sending out and control unit 7 grade. The mobile station 5 for information reception of the main base station 3, an information processor 6, sending out and a control device 7 and the base stations P1 and P2 in a train, and ... are connected by the cable 8, respectively.

[0026] The mobile station 5 for information reception (information receiving station outside a train) receives the electric-wave signal of the station guidance information from a station base station through antenna 5a, takes out station guidance information from the received wireless electric-wave signal, and outputs it to an information processor 6. Moreover, the mobile station 5 for information reception receives the public wireless electric wave besides a train 2 (wireless electric wave outside a train), measures field strength, and outputs the field strength information to an information processor 6. That is, out of a train 2, the public migration terminals 11 which talk over the telephone by the wireless electric wave using the public wireless service which the public base stations 10, such as PHS (Personal Handy Phone System) and a cell phone unit, and the public base station 10 offer, such as PHS and a cell phone unit, are used, and the mobile station 5 for information reception detects the wireless electric wave of these public base station 10, measures field strength, and outputs the field strength information to an information processor 6. And the mobile station 5 for information reception establishes the base station and link of the public wireless electric wave with the highest field strength among the public wireless electric waves besides the detected train 2, and is CS of the base station concerned. CS which acquired and acquired ID (Cell Station ID: ID of a base station) ID is outputted to an information processor 6.

[0027] While an information processor (control means) 6 edits the train guidance information broadcast by the alphabetic character or the image and outputs it to sending out and a control unit 7 as guidance information CS inputted from the mobile station 5 for information reception Based on ID, the base station of the received wireless electric wave distinguishes a station base station or the public base station 10. At the time of a station base station Make the mobile station 5 for information reception receive the wireless electric wave concerned, and it is made to acquire station guidance information. Output

to sending out and a control unit 7 by making acquired station guidance information into guidance information, and when the base station of the received wireless electric wave is not a station base station but the public base station 10 Based on the field strength of the wireless electric wave concerned, the output level of the base stations P1 and P2 in a train and the wireless electric wave which ... transmits is controlled, and it has a control section, a display, a control unit, the storage section, etc.

[0028] Namely, the train guidance information that the information processor 6 was inputted from the control unit, For example, train operation information (for example, current position etc.) and service information on other (for example, since it becomes the trouble of other visitors, please withhold the message of the radio telephone equipment within "train.) about operation of a train 2 " -- please give me use of "radio telephone equipment on the deck. " etc. is inputted, and such train guidance information that it was inputted is memorized by the storage section, is read to timely by the control section, and is outputted to sending out and a control unit 7 while being able to check it by the display. The storage section of an information processor 6 has memorized the name of the station of the operation route of a train 2, the route name, etc. while memorizing the above-mentioned train guidance information.

[0029] Moreover, an information processor 6 makes the base station and link of a wireless electric wave with the highest field strength establish among the public wireless electric waves which the mobile station 5 for information reception received to the mobile station 5 for information reception. CS of the base station of the wireless electric wave concerned ID is made to acquire and it is the acquired CS concerned. CS of the station base station where ID is registered beforehand When in agreement with ID, as mentioned above CS of the base station of a wireless electric wave which was made to receive the wireless electric wave concerned transmitted from a station base station, acquired station guidance information and received ID is CS of a station base station. When not in agreement with ID Based on the field strength information on the wireless electric wave concerned that it is inputted from the mobile station 5 for information reception, the output level of each base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced through sending out and the control device 7 mentioned later, or it is made to go up.

[0030] In addition, although the above-mentioned train guidance information may be inputted and edited by the control unit of an information processor 6, even if it is beforehand stored in the storage section of an information processor 6, it is stopped, and edits suitably the guidance information and train route circumference information which are beforehand stored in the storage section of an information processor 6 by the control unit.

[0031] Namely, while outputting an information processor 6 to sending out and a control unit 7 based on the program memorized by the storage section by making into guidance information the train operation information and service information which are memorized by timely at the storage section and which are train guidance information If station guidance information is inputted from the mobile station 5 for information reception, it

will output to sending out and a control unit 7 by making the station guidance information concerned into guidance information. Moreover, based on the field strength information inputted from the mobile station 5 for information reception, the output level of the base stations P1 and P2 in a train and the wireless electric wave outputted from ... is raised, or it is made to fall and controls. And the above-mentioned guidance information is created by text data, and is outputted to sending out and a control unit 7 as text data.

[0032] While sending out and a control unit 7 output guidance information, such as train guidance information that it is inputted from an information processor 6, and station guidance information, through a cable 8 to each base stations P1 and P2 in a train, and ... If the control instruction of the output level of a digital radio electric wave is inputted from an information processor 6 An output-level control signal is outputted to the base stations P1 and P2 in a train, and ..., and the output level of each base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced, or it is made to go up according to the control instruction concerned.

[0033] The base stations P1 and P2 in a train and ... are equipped with antennas A1 and A2 and ..., respectively. While transmitting the guidance information sent through a cable 8 by the digital radio electric wave of a predetermined output level to the digital migration terminal 4 through antennas A1 and A2 and ... The transmitting output-control section which is not illustrated is built in and the output level of the digital radio electric wave to send out is adjusted based on the output-level control signal from sending out and a control device 7.

[0034] The base stations P1 and P2 in this train and the guidance information sent out from ... are received by the digital migration terminal 4. The function in which the digital migration terminal (radio telephone equipment) 4 displays the text data which received to a usual cellular-phone terminal (Personal Handy Phone System : second generation cordless telephones system), for example, PHS, or a usual cell phone unit etc. on the display is added.

[0035] That is, although the digital migration terminal 4 is not illustrated, it is equipped with antenna 4a, the wireless section, a control section, a loudspeaker, a microphone, LCD (Liquid Crystal Display), the key input section, etc., and although it is the same configuration as the usual digital portable telephone, it has the function which displays the guidance information by the text data which received on LCD (display).

[0036] The wireless section of the digital migration terminal 4 is equipped with for example, a PLL synthesizer, a transceiver circuit, a modem, etc., and transmits and receives the electric wave of the frequency band used at the digital migration terminal 4. That is, local oscillation of the PLL synthesizer is carried out with the frequency set up by the control section, and it outputs the local oscillation signal for frequency conversion in a transceiver circuit to a transceiver circuit. By mixing the input signal which received by antenna 4a with the local oscillation signal into which it is inputted from a PLL synthesizer, a transceiver circuit carries out frequency conversion of the modulated wave

which carries out frequency conversion, and outputs to a modem, and is inputted from a modem, and transmits it from antenna 4a. A modem performs strange recovery processing of a transceiver signal. The wireless section outputs the information which carried out [above-mentioned] processing to a control section.

[0037] The control section of the digital migration terminal 4 is equipped with ADPCM (Adaptive Differential Pulse Code Modulation), outputs to a microphone about speech information among the information inputted from the wireless section, and outputs to LCD about character data while it controls each part of the digital migration terminal 4 based on the program memorized by the internal memory (for example, ROM) and performs actuation as a digital migration terminal 4. That is, a loudspeaker is connected with a microphone at the ADPCM, and a control section builds in a speech codec, and is enabling the voice message. After ADPCM takes out a slot from the data (frame) inputted from the wireless section to predetermined timing and cancels the scramble for tapping prevention etc., it takes out configuration data from a format of this slot, processes control data within a control section among this taken-out configuration data, and transmits voice data to the speech codec in ADPCM. Moreover, after ADPCM adds control data to the voice data transmitted from a speech codec, creates a slot and applies a scramble etc., it inserts a slot in a frame to predetermined timing, and outputs it to the wireless section. A speech codec performs compression and expanding processing of digital voice data, and, specifically, performs coding processing and decryption processing of digital voice data with the ADPCM method using adaptive prediction and adaptive quantization. Moreover, a speech codec is the transmitting side and is compressed by encoding the PCM sound signal inputted to ADPCM voice data. ADPCM changes into a digital sound signal the analog sound signal which changed into the analog sound signal the PCM sound signal sent from a speech codec, and was made to carry out a sound-reinforcement output from a loudspeaker through amplifier, and was inputted from the microphone, and outputs it to a speech codec as a PCM sound signal.

[0038] Moreover, the control section of the digital migration terminal 4 builds in the storage section which memorizes the translation table of KODO data (text data) and character data, and has memorized the kanji, kana, the alphabet, a figure, etc. as a character, for example. Moreover, in case the storage section of a control section uses the digital migration terminals 4, such as abbreviated dialing data, as a cellular-phone terminal, it memorizes various required data.

[0039] Furthermore, the control section of the digital migration terminal 4 makes the phase hand concerned do call origination of the phase hand telephone number which changed into character data the character code inputted from the key input section with reference to the above-mentioned storage section, and was made to carry out a display output to LCD, and was inputted from the key input section through the wireless section.

[0040] Furthermore, the control section of the digital migration terminal 4 acquires the text data inputted from the wireless section like the code input from the key input section, changes the guidance information which is the inputted text data concerned into text

(character data), and it carries out a display output to LCD.

[0041] Namely, the data concerned are text data by CI bit which the digital migration terminal 4 receives the base stations P1 and P2 in a train, and the guidance information sent out from ... by antenna 4a, and shows the channel type in the received data, For example, if it is shown that the channel concerned is a FACCH:high-speed accompanying control channel, a control section will judge that it is not voice data but text data, and will carry out the display output of the received data concerned to LCD by making into text guidance information which is the received data concerned.

[0042] Next, actuation of the gestalt of this operation is explained. While the broadcast system 1 in a train displays guidance information, such as train guidance information and station guidance information, on LCD which is the display of the digital migration terminal 4 The field strength of the public wireless electric wave besides the base stations P1 and P2 in a train and the train 2 of the same frequency band as the wireless electric wave which ... transmits is detected, and the description is in the place which prevents the failure done to use of the public migration terminal 11 using the public base station 10 besides a train 2 based on the field strength concerned.

[0043] That is, the base stations P1 and P2 in a train and ... are installed in each passenger cars M2 and M3 and ..., and the broadcast system 1 in a train is connected to each base stations P1 and P2 in a train, and sending out and the control device 7 with which ... was installed in the conductor car M1 by the cable 8. Sending out and a control unit 7 are connected to an information processor 6, and an information processor 6 outputs the train guidance information memorized by the storage section or the train guidance information that it was inputted by the control unit to sending out and a control unit 7 as guidance information on a text.

[0044] Sending out and a control device 7 send out the train guidance information (guidance information) that it was inputted from the information processor 6, through a cable 8 to each passenger cars M2 and M3, the base stations P1 and P2 in a train installed in ..., and ... the train guidance information that each base stations P1 and P2 in a train and ... are sent from sending out and a control device 7 -- antennas A1 and A2 and ... minding -- a digital radio electric wave -- passenger cars M2 and M3 and ... it transmits inside.

[0045] the carrier of the digital migration terminal 4 with which each base stations P1 and P2 in a train and ... were carried into passenger cars M2 and M3 and ... in advance of sending out of guidance information at this time -- sensing -- the passenger cars M2 and M3 concerned and ... the communication channel which the inner digital migration terminal 4 is using is detected. Detection of a communication channel of each base stations P1 and P2 in a train and ... notifies an usable communication channel by the control channel beforehand determined for every communication link entrepreneur.

[0046] If a control channel is specified from the base stations P1 and P2 in a train, and ..., each digital migration terminal 4 Establishment of the base stations P1 and P2 in a train,

and a ... and a radio link is required using the control channel as which the control section was specified through the wireless section. The base stations P1 and P2 in a train and ... If there is an establishment demand of a radio link from the digital migration terminal 4, a link will be established between the digital migration terminals 4 concerned.

[0047] and the passenger cars M2 and M3 in which, as for each base stations P1 and P2 in a train, and ..., the base stations P1 and P2 in a train and ... are installed, respectively and ... if a link is established between the inner digital migration terminals 4, the train guidance information sent for every predetermined time interval from sending out and a control unit 7 through a cable 8 is sent out through antennas A1 and A2 and ...

[0048] Each digital migration terminal 4 receives the base stations P1 and P2 in a train, and the train guidance information sent out from ... through antenna 4a, and the received data change the text data concerned which received into character data as it is text data, and it displays a control section on LCD.

[0049] That is, the physical slot for a communication link of PHS is used as the digital migration terminal 4 is PHS, it can distinguish whether data are text data in the FACCH:high-speed accompanying control channel of the physical slot for a communication link, and a control section will judge that received data are text data, if FACCH which shows that the data is text data in CI bit in received data is set up.

[0050] If the control section of the digital migration terminal 4 judges that received data are text data, it will change the received guidance information into character data for every code of text data with reference to the translation table memorized by the storage section, and will carry out the display output of the guidance information (train guidance information) to LCD.

[0051] and while sending out the train operation information about operation of the trains 2, such as the current position of a train 2, timely as train guidance information, the broadcast system 1 in a train the message of the radio telephone equipment within "train since it becomes trouble of other visitors, please withhold. " -- please give me use of "radio telephone equipment on the deck. The service information on others, such as ", is sent out to the interval which sends out train operation information timely.

[0052] Therefore, it can notify service information appropriately while the broadcast system 1 in a train can make the digital migration terminal 4 of the PAX's hand able to receive train guidance information, can display train guidance information on the LCD and can report train guidance information, such as train operation information, to the PAX certainly.

[0053] Moreover, the broadcast system 1 in a train makes the public wireless electric wave besides the base stations P1 and P2 in a train, and the train 2 of the same frequency band as the wireless electric wave which ... transmits always detect with the mobile station 5 for information reception. The base station and link of a wireless electric wave with the highest field strength are made to establish among the field strength of the

wireless electric wave concerned, and it is CS of the base station of the public wireless electric wave concerned. By checking ID Reception of the guidance information from a station base station and the output level of the base stations P1 and P2 in a train and the wireless electric wave which ... transmits are adjusted.

[0054] That is, the station base station is installed in each station, and a station base station transmits the station guidance information memorized by the storage, for example, a name of the station etc., by the wireless electric wave of feeble predetermined frequency receivable only within predetermined point-blank range (microcell). Moreover, out of a train 2, the public base station 10 is depending on the route where trains 2 run, and radio by the public migration terminal 11 using the public base station 10 is performed.

[0055] Then, the main base station 3 monitors the public wireless electric wave besides a train 2 continuously with the mobile station 5 for information reception, and it supervises field strength, an information processor 6 making the mobile station 5 for information reception measure the field strength, and establishing the base station and link of a wireless electric wave with the highest field strength. An information processor 6 is CS of the base station of the wireless electric wave concerned, when the field strength which the mobile station 5 for information reception measured exceeds the criteria field strength set up beforehand. ID is acquired and it is CS of a station base station. It is confirmed whether it is in agreement with ID. Information processors 6 are both CS. If ID is in agreement, the wireless electric wave concerned will be received and station guidance information will be received.

[0056] That is, if a train 2 enters in the microcell of the wireless electric wave which a station base station transmits, the mobile station 5 for information reception carried in the train 2 will receive the wireless electric wave of station guidance information, and the mobile station 5 for information reception will output the received station guidance information to an information processor 6.

[0057] An information processor 6 outputs the station guidance information that it was inputted from the mobile station 5 for information reception as well as train guidance information to sending out and a control unit 7 as guidance information which consists of text data. Sending out and a control device 7 send out the station guidance information (guidance information) that it was inputted from the information processor 6, through a cable 8 to the conductor car M1 and each passenger cars M2 and M3, the base stations P1 and P2 in a train installed in ..., and ... the station guidance information that each base stations P1 and P2 in a train and ... are sent from sending out and a control device 7 -- antennas A1 and A2 and ... minding -- a digital radio electric wave -- a caboose car -- both -- M and passenger cars M2 and M3, and ... it transmits inside.

[0058] Each digital migration terminal 4 receives the base stations P1 and P2 in a train, and the station guidance information sent out from ... through antenna 4a, like the above-mentioned train guidance information, changes the station guidance information which is

the text data which received into character data, and displays it on LCD.

[0059] therefore, a caboose car -- both -- M1 and passenger cars M2 and M3, and ... station guidance information can be displayed on the digital migration terminal 4 which the inner PAX is carrying in an alphabetic character, and guidance information including which station the train 2 has approached and station guidance information can be transmitted suitable for the PAX.

[0060] Since the digital migration terminal 4 has received guidance information for every predetermined timing, without establishing the base stations P1 and P2 in a train, and the link which was able to take the synchronization between ..., and using a control channel, there is no effect in the anticipated use of the digital migration terminal 4, and it can telephone [usual] using the digital migration terminal 4, and can receive arrival of the mail.

[0061] And an information processor 6 is CS of the base station of the public wireless electric wave which the above-mentioned mobile station 5 for information reception received. ID is CS of a station base station. When not in agreement with ID, according to the field strength of the public wireless electric wave concerned, the output level of the base stations P1 and P2 in a train and the digital radio electric wave outputted from ... is adjusted.

[0062] That is, an information processor 6 is CS of the base station of a public wireless electric wave inputted from the mobile station 5 for information reception. ID is CS of a station base station. When not in agreement with ID, it judges that the base station of the wireless electric wave concerned is the public base station 10, and the directions to which the output level of the base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced on predetermined low-power output level are outputted to sending out and a control unit 7. Sending out and a control device 7 will output the base stations P1 and P2 in a train, and the output-level control signal which reduces the output level of a wireless electric wave to ..., if directions of a wireless output-level fall are inputted from an information processor 6. If the output-level control signal with which each base stations P1 and P2 in a train and ... direct the fall of the output level of a wireless electric wave is inputted, the output level of the digital radio electric wave to send out will be reduced by the transmitting output-control section which is not illustrated.

[0063] Then, an information processor 6 will output the directions which raise the output level of the base stations P1 and P2 in a train, and the wireless electric wave which ... outputs to sending out and a control device 7, if the mobile station 5 for information reception becomes [the field strength which the field strength information on the public wireless electric wave besides the train 2 received through antenna 5a shows] smaller than criteria field strength. Sending out and a control device 7 will output the base stations P1 and P2 in a train, and the output-level control signal which raises the output level of a wireless electric wave to ..., if directions of a rise of the output level of a wireless electric wave are inputted from an information processor 6. If the output-level

control signal with which each base stations P1 and P2 in a train and ... direct the rise of the output level of a wireless electric wave is inputted, the output level of the digital radio electric wave to send out will be raised by the transmitting output-control section.

[0064] Therefore, it sets in the area which may generate wireless failures, such as a high density area where the public migration terminal 11 besides a train 2 is used, performing broadcast into the train 2 of suitable guidance information. It is received by the public migration terminal 11 besides a train 2, and the broadcasting electric-wave (the base stations P1 and P2 in a train, digital wireless electric wave transmitted into a train 2 from ...) which leaks from the inside of a train 2 passes unnecessary information to the public migration terminal 11 besides a train 2. The public migration terminal 11 besides a train 2 can be affected, or it can prevent that a wireless failure occurs.

[0065] If it is, the broadcast system 1 in a train is equipped with the station base station which carries out wireless transmission of the station guidance information at a train 2. in addition, the gestalt of the above-mentioned implementation -- The mobile station 5 for information reception of the main base station 3 receives the wireless electric wave of the station guidance information from a station base station, and public wireless electric waves other than this. The base station and link of the wireless electric wave are established, and it is CS. Although ID is acquired, a station base station or the public base station 10 is distinguished and reception of station guidance information and the output level of the base stations P1 and P2 in a train and the wireless electric wave which ... transmits are adjusted As a broadcast system 1 in a train, you may not have the station base station.

[0066] In this case, since the mobile station 5 for information reception of the main base station 3 does not need to receive station guidance information from a station base station, it detects only a public wireless electric wave and should just detect that field strength. Therefore, in this case, the mobile station 5 for information reception establishes a link between the base stations of the wireless electric wave besides a train 2, and is CS of a base station. It is not necessary to check ID. Namely, PS for using the public wireless service which the public base station 10 offers It is not necessary to have ID (Personal Station ID: mobile station ID), and the mobile station 5 for information reception detects the public wireless electric wave besides the base stations P1 and P2 in a train, and the train 2 of the same frequency band as the wireless electric wave which ... transmits, detects the field strength, and should just output field strength information to an information processor 6. And if the field strength information as which an information processor 6 is inputted from the mobile station 5 for information reception exceeds the criteria field strength set up beforehand, the output level of the base stations P1 and P2 in a train and the wireless electric wave which ... transmits will be reduced to a predetermined output level.

[0067] Drawing 2 is the system configuration Fig. of the broadcast system 20 in a train which applied the gestalt of operation of the 2nd of the broadcast system in a train of this invention.

[0068] The gestalt of this operation is applied to the same broadcast system in a train as the gestalt of implementation of the above 1st, and the detailed explanation is omitted in explanation of the gestalt of this operation using the same sign to the same component as the broadcast system 1 in a train of the gestalt of implementation of the above 1st.

[0069] In drawing 2 the broadcast system 20 in a train like the gestalt of implementation of the above 1st The station base station installed in each station (illustration abbreviation), the caboose car the conductor of a train 2 gets into [caboose car] -- both -- the main base station 21 carried in M1, and a caboose car -- both -- the passenger cars M2 and M3 the PAX of M1 and a train 2 gets into [passenger cars], the base stations P1 and P2 in the train carried in ..., respectively, ..., a caboose car -- both -- M1 and each passenger cars M2 and M3 -- It has the digital migration terminal 4 grade which the PAX who gets into [...] carries.

[0070] The main base station 21 is equipped with the same information processor 6 as the gestalt of the 1st operation, and sending out and control unit 7 grade while it is carried in the conductor car M1 of a train 2 and is equipped with two mobile stations 22 and 23 for information reception (information receiving station outside a train). The mobile stations 22 and 23 for information reception of the main base station 21, an information processor 6, sending out and a control device 7 and the base stations P1 and P2 in a train, and ... are connected by the cable 8, respectively.

[0071] In the transit middle class of a train 2, without receiving the public wireless electric wave of the 1.9GHz band which are the base stations P1 and P2 in a train besides a train 2, and the same frequency band as the wireless electric wave which ... transmits through antenna 22a, and forming a link, the mobile station 22 for information reception detects the public wireless electric wave, and outputs field strength information to an information processor 6. Namely, two or more public wireless services which the public base stations 10, such as PHS, and the public base station 10 offer out of a train 2, For example, the public migration terminals 11, such as PHS which talks over the telephone using wireless electric waves to offer, such as NTT personal, a DDI pocket, and ASTEL (Astel), are used. The wireless electric wave in the 1.9GHz band which the public base station 10 of these plurality offers is not depended on the class of the carrier, but the mobile station 5 for information reception receives it altogether, without forming a link, detects, measures the field strength, and outputs field strength information to an information processor 6. At this time, the mobile station 22 for information reception receives and detects the wireless electric wave sent not only from the wireless electric wave from the public base station 10 but from the public migration terminal 11, and outputs the field strength information which measured and measured that field strength to an information processor 6.

[0072] The mobile station 23 for information reception receives the station guidance information transmitted by the 800MHz wireless electric wave which is the frequency band which a station base station to the public base stations 10, such as predetermined frequency PHS, for example, the above etc., use, for example, a different frequency from 1.9GHz. That is, if the call from a station base station is always gone into the cel area

(range which a wireless electric wave reaches) of waiting and a station base station, the mobile station 23 for information reception will form a station base station and a link, and will receive the wireless electric-wave signal of the station guidance information by 800 etc.MHz etc. through antenna 23a. The mobile station 23 for information reception takes out station guidance information from the received electric-wave signal, and outputs it to an information processor 6.

[0073] While an information processor (control means) 6 edits the train guidance information broadcast by the alphabetic character or the image as well as the case of the gestalt of the above-mentioned implementation and outputs it to sending out and a control unit 7 as guidance information It outputs to sending out and a control unit 7 by making into guidance information station guidance information that it is inputted from the mobile station 23 for information reception. Moreover, based on the field strength information inputted from the mobile station 22 for information reception, the output level of each base stations P1 and P2 in a train and the digital radio electric wave which ... transmits is reduced through sending out and a control device 7, or it is made to go up.

[0074] While sending out and a control unit 7 output guidance information, such as train guidance information that it is inputted from an information processor 6, and station guidance information, through a cable 8 to each base stations P1 and P2 in a train, and ... If the control instruction of the output level of a digital radio electric wave is inputted from an information processor 6 An output-level control signal is outputted to the base stations P1 and P2 in a train, and ..., and the output level of each base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced, or it is made to go up according to the control instruction concerned.

[0075] While transmitting the digital radio electric wave of a predetermined output level for the guidance information to which the base stations P1 and P2 in a train and ... have been sent through a cable 8 to the digital migration terminal 4 through antennas A1 and A2 and ..., the output level of the digital radio electric wave sent out based on the output-level control signal from sending out and a control device 7 is adjusted. And guidance information is transmitted using the wireless electric wave of the 1.9GHz band for which the base stations P1 and P2 in this train and ... are used with PHS etc.

[0076] Next, actuation of the gestalt of this operation is explained. While the broadcast system 20 in a train displays guidance information, such as train guidance information and station guidance information, on LCD which is the display of the digital migration terminal 4 The mobile station 23 for information reception of station guidance information reception only receives the station guidance information transmitted from a station base station by the wireless electric wave of the frequency band of cell phone units, such as 800 etc.MHz. While the mobile station 22 for information reception of the frequency band concerned only for wireless electric waves receives the public wireless electric wave besides the trains 2, such as PHS of a 1.9GHz band, and receiving station guidance information appropriately The field strength of the public wireless electric wave besides a train 2 is distinguished much more appropriately and simply, and the description is in the place which prevents much more appropriately the wireless failure

done to use of the public migration terminal 11 using the public base station 10 besides a train 2.

[0077] Namely, the train guidance information that, as for the broadcast system 20 in a train, the information processor 6 is memorized by the storage section, Or the train guidance information that it was inputted by the control unit is sent out to the base stations P1 and P2 in a train, and ... through sending out and a control unit 7 as guidance information on a text. By sensing the carrier of the digital migration terminal 4 with which each base stations P1 and P2 in a train and ... were carried into passenger cars M2 and M3 and ... After detecting an usable communication channel, using the usable channel concerned and establishing the digital migration terminal 4 and a radio link, the wireless electric wave of a 1.9GHz band sends out train guidance information.

[0078] The base stations P1 and P2 in a train and the train guidance information sent out from ... are received through antenna 4a, the received data change the text data concerned which received into character data as it is text data, and each digital migration terminal 4 displays it on LCD.

[0079] Therefore, it can notify service information appropriately while the broadcast system 20 in a train can make the digital migration terminal 4 of the PAX's hand able to receive train guidance information, can display train guidance information on the LCD and can report train guidance information, such as train operation information, to the PAX certainly.

[0080] The broadcast system 20 in a train moreover, station guidance information from the station base station installed in each station By the base stations P1 and P2 in a train and the wireless electric wave of a different frequency band from the wireless electric wave (1.9GHz band) which ... transmits, for example, the 800MHz wireless electric wave which a cell phone unit uses If it transmits as a feeble electric-wave signal receivable only within microcell and a train 2 enters in this microcell The mobile station 23 for information reception of station guidance information reception only carried in the train 2 receives the electric-wave signal of station guidance information through antenna 23a, and outputs the received station guidance information to an information processor 6.

[0081] An information processor 6 sends out the station guidance information that it was inputted from the mobile station 23 for information reception as well as train guidance information, through sending out and a control unit 7 to the conductor car M1 and each passenger cars M2 and M3, the base stations P1 and P2 in a train installed in ..., and ... as guidance information which consists of text data. the station guidance information that each base stations P1 and P2 in a train and ... are sent from sending out and a control unit 7 -- antennas A1 and A2 and ... minding -- the digital radio electric wave of a 1.9GHz band -- a caboose car -- both -- M1 and passenger cars M2 and M3, and ... it transmits inside.

[0082] Each digital migration terminal 4 receives the base stations P1 and P2 in a train, and the station guidance information sent out from ... through antenna 4a, changes the

station guidance information which is the text data which received into character data, and displays it on LCD.

[0083] Therefore, the mobile station 23 for information reception of dedication of the station guidance information by the wireless electric wave of a different frequency band (for example, 800MHz) from the frequency of the base stations P1 and P2 in a train from a station base station and the wireless electric wave which ... transmits receives certainly. a caboose car -- both -- M1 and passenger cars M2 and M3, and ... station guidance information can be displayed on the digital migration terminal 4 which the inner PAX is carrying in an alphabetic character, and guidance information including which station the train 2 has approached and station guidance information can be transmitted to the PAX appropriately and certainly.

[0084] And the train broadcast system 20 monitors continuously the condition of the wireless electric wave of the 1.9GHz band besides the train 2 which is the same frequency band as the wireless electric wave which the base stations P1 and P2 in a train and ... transmit with the mobile station 22 for information reception, and adjusts the output level of the base stations P1 and P2 in a train, and the digital radio electric wave outputted from ... according to the field strength of the wireless electric wave of the frequency band concerned besides a train 2.

[0085] That is, without always receiving the public wireless electric wave of the 1.9GHz band besides a train 2 through antenna 22a, and establishing the base station and link of the public wireless electric wave concerned, the mobile station 22 for information reception measures the field strength of the public wireless electric wave of the received 1.9GHz band, and outputs the measured field strength information concerned to an information processor 6. An information processor 6 outputs the directions to which the output level of the digital radio electric wave to which the base stations P1 and P2 in a train and ... will output the field strength information on this public wireless electric wave if the field strength of the received public wireless electric wave is larger than criteria field strength as compared with the criteria field strength set up beforehand is reduced to sending out and a control unit 7. Sending out and a control device 7 will output the base stations P1 and P2 in a train, and the output-level control signal which reduces the output level of a wireless electric wave to ..., if directions of a fall of the output level of a wireless electric wave are inputted from an information processor 6. If the output-level control signal with which each base stations P1 and P2 in a train and ... direct the fall of the output level of a wireless electric wave is inputted, the output level of the digital radio electric wave to send out will be reduced to a predetermined output level by the transmitting output-control section which is not illustrated. Since the mobile station 22 for information reception does not establish the base station and link of a public wireless electric wave at this time, it is not based on the difference among two or more carriers, but while being able to detect the wireless electric wave in a 1.9GHz band, not only the public base station 10 but the wireless electric wave sent from the public migration terminal 11 can be detected.

[0086] And an information processor 6 will output the directions which raise the output level of the base stations P1 and P2 in a train, and the wireless electric wave which ... outputs to sending out and a control device 7, if the mobile station 22 for information reception becomes [the field strength which the field strength information on the public wireless electric wave besides the train 2 received through antenna 22a shows] smaller than criteria field strength. Sending out and a control device 7 will output the base stations P1 and P2 in a train, and the output-level control signal which raises the output level of a wireless electric wave to ..., if directions of a rise of the output level of a wireless electric wave are inputted from an information processor 6. If the output-level control signal with which each base stations P1 and P2 in a train and ... direct the rise of the output level of a wireless electric wave is inputted, the output level of the digital radio electric wave to send out will be raised by the transmitting output-control section.

[0087] Therefore, it sets in the area which may generate wireless failures, such as a high density area where the public migration terminal 11 besides a train 2 is used, broadcasting suitable guidance information. The 1.9GHz broadcasting electric-wave which leaks from the inside of a train 2 is received by the public migration terminal 11 besides a train 2, and unnecessary information is passed to the public migration terminal 11 besides a train 2, and the public migration terminal 11 besides a train 2 can be affected, or it can prevent much more certainly that a wireless failure occurs.

[0088] Drawing 3 is the system configuration Fig. of the broadcast system 30 in a train which applied the gestalt of operation of the 3rd of the broadcast system in a train of this invention.

[0089] The gestalt of this operation is applied to the same broadcast system in a train as the gestalt of implementation of the above 1st, and the detailed explanation is omitted in explanation of the gestalt of this operation using the same sign to the same component as the broadcast system 1 in a train of the gestalt of implementation of the above 1st.

[0090] In drawing 3 the broadcast system 30 in a train like the gestalt of implementation of the above 1st The station base station installed in each station (illustration abbreviation), the caboose car the conductor of a train 2 gets into [caboose car] -- both -- the main base station 31 carried in M1, and a caboose car -- both -- the passenger cars M2 and M3 the PAX of M1 and a train 2 gets into [passenger cars], the base stations P1 and P2 in the train carried in ..., respectively, ..., a caboose car -- both -- M1 and each passenger cars M2 and M3 -- It has the digital migration terminal 4 grade which the PAX who gets into [...] carries.

[0091] The main base station 31 is equipped with the same information processor 6 as the gestalt of the 1st operation, and sending out and control unit 7 grade while it is carried in the conductor car M1 of a train 2 and is equipped with the mobile station 32 for information reception. The mobile station 32 for information reception of the main base station 31, an information processor 6, sending out and a control device 7 and the base stations P1 and P2 in a train, and ... are connected by the cable 8, respectively.

[0092] the wireless electric wave of the frequency band which the public base stations 10, such as the predetermined frequency PHS to which a station base station sends out the mobile station 32 for information reception, for example, the above etc., use, and the same frequency band as 1.9GHz, for example, NTT, -- the personal wireless electric wave in the self-management mode (mode wide opened for self-management to public mode) to offer receives the station guidance information transmitted from a station base station.

[0093] That is, if the call from a station base station is always gone into the cel area (range which a wireless electric wave reaches) of waiting and a station base station, the mobile station 32 for information reception will form a station base station and a link, and will receive the wireless electric-wave signal of station guidance information with a 1.9GHz band through antenna 32a. The mobile station 32 for information reception takes out station guidance information from the received electric-wave signal, and outputs it to an information processor 6.

[0094] Moreover, in the transit middle class of a train 2, the mobile station 32 for information reception receiving the public wireless electric wave of the 1.9GHz band besides a train 2 through two or more antenna 32a, and establishing a link, it measures the field strength of the public wireless electric wave, and outputs the field strength information to an information processor 6.

[0095] Namely, two or more public wireless services which the public base stations 10, such as PHS, and the public base station 10 offer out of a train 2, For example, the public migration terminals 11, such as PHS which talks over the telephone using wireless electric waves to offer, such as NTT personal, a DDI pocket, and ASTEL (Astel), are used. The mobile station 5 for information reception receiving the wireless electric wave in the 1.9GHz band which the public base station 10 of these plurality offers, and establishing the public base station 10 and a link concerned, the field strength is measured and it outputs the measured field strength information to an information processor 6.

[0096] While an information processor 6 edits the train guidance information broadcast by the alphabetic character or the image as well as the case of the gestalt of the above-mentioned implementation and outputs it to sending out and a control unit 7 as guidance information It outputs to sending out and a control unit 7 by making into guidance information station guidance information that it is inputted from the mobile station 32 for information reception. Moreover, based on the field strength information inputted from the mobile station 32 for information reception, the output level of each base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced through sending out and a control device 7, or it is made to go up.

[0097] While sending out and a control unit 7 output guidance information, such as train guidance information that it is inputted from an information processor 6, and station guidance information, through a cable 8 to each base stations P1 and P2 in a train, and ... If the control instruction of the output level of a digital radio electric wave is inputted

from an information processor 6 An output-level control signal is outputted to the base stations P1 and P2 in a train, and ..., and the output level of each base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced, or it is made to go up according to the control instruction concerned.

[0098] While transmitting the digital radio electric wave of a predetermined output level for the guidance information to which the base stations P1 and P2 in a train and ... have been sent through a cable 8 to the digital migration terminal 4 through antennas A1 and A2 and ..., the output level of the digital radio electric wave sent out based on the output-level control signal from sending out and a control device 7 is adjusted. And it transmits by the wireless electric wave of the frequency of the 1.9GHz band for which the base stations P1 and P2 in a train and ... are used with PHS etc. in guidance information.

[0099] Next, actuation of the gestalt of this operation is explained. While the broadcast system 30 in a train displays guidance information, such as train guidance information and station guidance information, on LCD which is the display of the digital migration terminal 4 The mobile station 32 for information reception receives the station guidance information transmitted by the wireless electric wave of the frequency of a 1.9GHz band from a station base station, and the public wireless electric wave of the 1.9GHz band besides a train 2, and the public wireless electric wave and link besides a train 2 are established. While distinguishing whether it is a station base station and receiving station guidance information appropriately According to the field strength of the wireless electric wave from base stations other than a station base station, the output level of the base stations P1 and P2 in a train and the wireless electric wave transmitted from ... is controlled. The description is in the place which prevents much more appropriately the wireless failure done to the radio of the public migration terminal 11 using the public base station 10 besides a train 2.

[0100] Namely, the train guidance information that, as for the broadcast system 30 in a train, the information processor 6 is memorized by the storage section, Or the train guidance information that it was inputted by the control unit is sent out to each passenger cars M2 and M3, the base stations P1 and P2 in a train installed in ..., and ... through sending out and a control unit 7 as guidance information on a text. By sensing the carrier of the digital migration terminal 4 with which each base stations P1 and P2 in a train and ... were carried into passenger cars M2 and M3 and ... After detecting an usable communication channel, using the usable channel concerned and establishing the digital migration terminal 4 and a radio link, the wireless electric wave of the frequency of a 1.9GHz band sends out train guidance information.

[0101] The base stations P1 and P2 in a train and the guidance information sent out from ... are received through antenna 4a, the received data change the text data concerned which received into character data as it is text data, and each digital migration terminal 4 displays it on LCD.

[0102] Therefore, it can notify service information appropriately while the broadcast system 30 in a train can make the digital migration terminal 4 of the PAX's hand able to

receive train guidance information, can display train guidance information on the LCD and can report train guidance information, such as train operation information, to the PAX certainly.

[0103] Moreover, when the field strength of the wireless electric wave of the frequency of the 1.9GHz band which monitored the wireless electric wave of the frequency of the 1.9GHz band besides a train 2 continuously with the mobile station 32 for information reception, and the mobile station 32 for information reception received exceeds the field strength set up beforehand, the broadcast system 30 in a train establishes the base station and link of the wireless electric wave concerned, and an information processor 6 is the CS. ID is checked. An information processor 6 is the CS concerned of the base station of a wireless electric wave which received. CS of the station base station where ID is registered beforehand If in agreement with ID, it will judge that the base station of the received wireless electric wave concerned is a station base station, and station guidance information will be received through the mobile station 32 for information reception.

[0104] That is, if a station base station transmits station guidance information from the station base station installed in each station by the wireless electric wave of the frequency in the self-management mode of NTT of a feeble 1.9GHz band which can receive only within microcell and a train 2 enters in this microcell, the mobile station 32 for information reception carried in the train 2 will receive the wireless electric-wave signal of the station guidance information on the frequency in the self-management mode of NTT of a 1.9GHz band through antenna 32a. An information processor 6 is CS of the base station of the wireless electric wave which the mobile station 32 for information reception received. ID is CS of a station base station. If in agreement with ID, it will judge that the base station of the wireless electric wave concerned is a station base station, and station guidance information will be received through the mobile station 32 for information reception.

[0105] An information processor 6 minds as guidance information which consists of text data, and sends out the station guidance information that it was inputted from the mobile station 32 for information reception as well as train guidance information to the conductor car M1 and each passenger cars M2 and M3, the base stations P1 and P2 in a train installed in ..., and ... the station guidance information that each base stations P1 and P2 in a train and ... are sent from sending out and a control unit 7 -- antennas A1 and A2 and ... minding -- the digital radio electric wave of the frequency of a 1.9GHz band -- a caboose car -- both -- M1 and passenger cars M2 and M3, and ... it transmits inside.

[0106] Each digital migration terminal 4 receives the station guidance information on the wireless electric wave of the frequency of the base stations P1 and P2 in a train, and the 1.9GHz band sent out from ... through antenna 4a, changes the station guidance information which is the text data which received into character data, and displays it on LCD.

[0107] Therefore, the mobile station 32 for information reception receives certainly the station guidance information from a station base station. a caboose car -- both -- M1 and

passenger cars M2 and M3, and ... station guidance information can be displayed on the digital migration terminal 4 which the inner PAX is carrying in an alphabetic character, and guidance information including which station the train 2 has approached and station guidance information can be transmitted to the PAX appropriately and certainly.

[0108] And an information processor 6 is CS of the base station of the public wireless electric wave beyond the above-mentioned predetermined field strength. ID is CS of a station base station. When not in agreement with ID, it judges that the base stations concerned are public base stations 10 other than a station base station, and the output level of the base stations P1 and P2 in a train and the digital radio electric wave outputted from ... is adjusted according to the field strength of the public wireless electric wave besides the train 2 concerned.

[0109] That is, the mobile station 32 for information reception always receives the public wireless electric wave of the 1.9GHz band besides a train 2 through antenna 32a, measures the field strength of the public wireless electric wave of the received 1.9GHz band, and outputs the measured field strength information concerned to an information processor 6. An information processor 6 compares the field strength information on this public wireless electric wave with the criteria field strength set up beforehand. If the field strength of the received public wireless electric wave is larger than criteria field strength, the mobile station 32 for information reception is made to establish the base station and link of the wireless electric wave concerned. The CS ID is checked and it is the CS concerned. ID is CS of a station base station. When not in agreement with ID, it judges that it is the public base station 10, and the directions to which the output level of the base stations P1 and P2 in a train and the digital radio electric wave which ... outputs is reduced are outputted to sending out and a control unit 7. Sending out and a control device 7 will output the base stations P1 and P2 in a train, and the output-level control signal which reduces the output level of a wireless electric wave to ..., if directions of a fall of the output level of a wireless electric wave are inputted from an information processor 6. If the output-level control signal with which each base stations P1 and P2 in a train and ... direct the fall of the output level of a wireless electric wave is inputted, the output level of the digital radio electric wave to send out will be reduced by the transmitting output-control section which is not illustrated.

[0110] And an information processor 6 will output the directions which raise the output level of the base stations P1 and P2 in a train, and the wireless electric wave which ... outputs to sending out and a control device 7, if the mobile station 22 for information reception becomes [the field strength of the public wireless electric wave from the public base station 10 received through antenna 22a] smaller than criteria field strength. Sending out and a control device 7 will output the base stations P1 and P2 in a train, and the output-level control signal which raises the output level of a wireless electric wave to ..., if directions of a rise of the output level of a wireless electric wave are inputted from an information processor 6. If the output-level control signal with which each base stations P1 and P2 in a train and ... direct a wireless output rise is inputted, the output level of the digital radio electric wave to send out will be raised by the transmitting

output-control section.

[0111] Therefore, it sets in the area which may generate wireless failures, such as a high density area where the public migration terminal 11 besides a train 2 is used, broadcasting suitable guidance information. The broadcasting electric-wave which leaks from the inside of a train 2 is received by the public migration terminal 11 besides a train 2, and unnecessary information is passed to the public migration terminal 11 besides a train 2, and the public migration terminal 11 besides a train 2 can be affected, or it can prevent much more certainly that a wireless failure occurs.

[0112] As mentioned above, although invention made by this invention person was concretely explained based on the gestalt of suitable operation, it cannot be overemphasized that it can change variously in the range which this invention is not limited to the above-mentioned thing, and does not deviate from the summary.

[0113]

[Effect of the Invention] According to the broadcast system in a train of invention according to claim 1, the main base station carried in the train Output train guidance information, such as an operation situation of a train, to the base station in a train carried in each passenger car as guidance information which consists of text data, and each base station in a train transmits guidance information into a passenger car by the digital radio electric wave. While the radio telephone equipment in a passenger car receives the digital radio electric wave of this guidance information, changes the guidance information concerned into text and displays on a display The information receiving station outside a train detects the wireless electric wave outside a train of the same frequency band as the wireless electric wave which the base station in a train transmits, and measures the field strength. Since a control means controls the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the wireless electric wave outside a train concerned While being able to display on the radio telephone equipment with which the PAX in a passenger car is carrying the guidance information which consists of text data in an alphabetic character etc. and being able to transmit train guidance information, such as an operation situation of a train, suitable for the PAX In case it passes through the area where a train may generate wireless failures, such as an area with much traffic, and a residential street Based on the field strength of the wireless electric wave outside a train, the output level of the digital radio electric wave transmitted from each base station in a train is controlled automatically. It can prevent that guidance information is received by the radio telephone equipment besides a train, and unnecessary information flows to the radio telephone equipment besides a train, or can prevent doing a wireless failure to the radio telephone equipment besides a train etc.

[0114] While outputting train guidance information, such as an operation situation of a train, to the base station in a train carried in each passenger car as guidance information which consists of text data from the main base station carried in the train according to the broadcast system in a train of invention according to claim 2 The main base station which transmitted the station guidance information about the station concerned to the train within predetermined distance from the station base station installed in each station, and

was carried in the train in the information receiving station outside a train Detect the wireless electric wave outside a train of the same frequency band as the wireless electric wave which the base station in a train transmits, and the field strength is measured. Establish the base station and link of the highest wireless electric wave outside a train of the field strength concerned, check the ID, and a control means compares the ID concerned with ID of a station base station. If in agreement, will receive the wireless electric wave outside a train concerned, and station guidance information will be acquired. The main base station outputs this station guidance information to the base station in a train carried in each passenger car as guidance information which consists of text data. Each base station in a train transmits the guidance information on station guidance information and train guidance information into a passenger car by the digital radio electric wave, and the radio telephone equipment in a passenger car receives the digital radio electric wave of this guidance information. While changing the guidance information concerned into text and displaying on a display, when ID of the base station of the wireless electric wave outside a train is ID and the inequality of a station base station Since the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the wireless electric wave outside a train which the control means measured is controlled The guidance information which is train guidance information and station guidance information is displayed on the radio telephone equipment which the PAX in a passenger car is carrying in an alphabetic character etc. While being able to transmit guidance information including which station the train guidance information and the trains of a train, such as an operation situation, have approached, and station guidance information suitable for the PAX In case it passes through the area where a train may generate wireless failures, such as an area with much traffic, and a residential street Based on the field strength of the wireless electric wave outside a train, the output level of the digital radio electric wave transmitted from each base station in a train is controlled automatically. It can prevent that guidance information is received by the radio telephone equipment besides a train, and unnecessary information flows to the radio telephone equipment besides a train, or can prevent doing a wireless failure to the radio telephone equipment besides a train etc.

[0115] Since station guidance information is transmitted by the wireless electric wave of the frequency band where a station base station differs from the frequency band of the wireless electric wave which the base station in a train transmits according to the broadcast system in a train of invention according to claim 3 The output level of the wireless electric wave which the base station in a train transmits only based on the field strength of the wireless electric wave outside a train of the same frequency band as the frequency band of the wireless electric wave which the base station in a train transmits is controlled. Guidance information is received by the radio telephone equipment besides a train, and it can prevent much more appropriately and cheaply that unnecessary information flows to the radio telephone equipment besides a train, or can prevent much more appropriately and cheaply doing a wireless failure to the radio telephone equipment besides a train etc.

[0116] According to the broadcast system in a train of invention according to claim 4, the wireless electric wave outside a train of two or more frequency bands is received.

Establish the base station and link of the wireless electric wave concerned, check the ID, and the ID concerned is compared with ID of the station base station registered beforehand. When in agreement and ID of the wireless electric wave outside a train which received the wireless electric wave concerned, acquired station guidance information, and received is ID and the inequality of a station base station Since the output level of the wireless electric wave which the base station in a train transmits according to the field strength of the measured wireless electric wave outside a train is controlled, it can prevent appropriately doing a wireless failure to the radio telephone equipment besides the train using the wireless electric wave of a larger frequency band etc.

[Claim(s)]

[Claim 1] The base station in a train of a train which is installed in each passenger car at least, and transmits a digital wireless electric wave, The main base station which is connected to the base station in said train, and outputs train guidance information, such as an operation situation of said train, to the base station in said train as guidance information which consists of text data, While having a predetermined display, receiving a digital radio electric wave, changing that the wireless electric wave concerned is text data into text and carrying out a display output to said display It has the radio telephone equipment in which the message which used said digital radio electric wave is possible. Said main base station outputs said train guidance information to each [said] base station in a train as said guidance information which consists of said text data. Each [said] base station in a train transmits the guidance information concerned into said passenger car by said wireless electric wave. Said radio telephone equipment in said passenger car receives said wireless electric wave of said guidance information transmitted from the base station in said train. It is the broadcast system in a train which changes the guidance information concerned into text and is displayed on said display. Said main base station The wireless electric wave outside a train of the same frequency band as said wireless electric wave which the base station in said train transmits is detected. The broadcast system in a train characterized by having the control means which controls the output level of said wireless electric wave which the base station in said train transmits according to the field strength of said wireless electric wave outside a train which the information receiving station outside a train which measures the field strength, and said information receiving station outside a train measured.

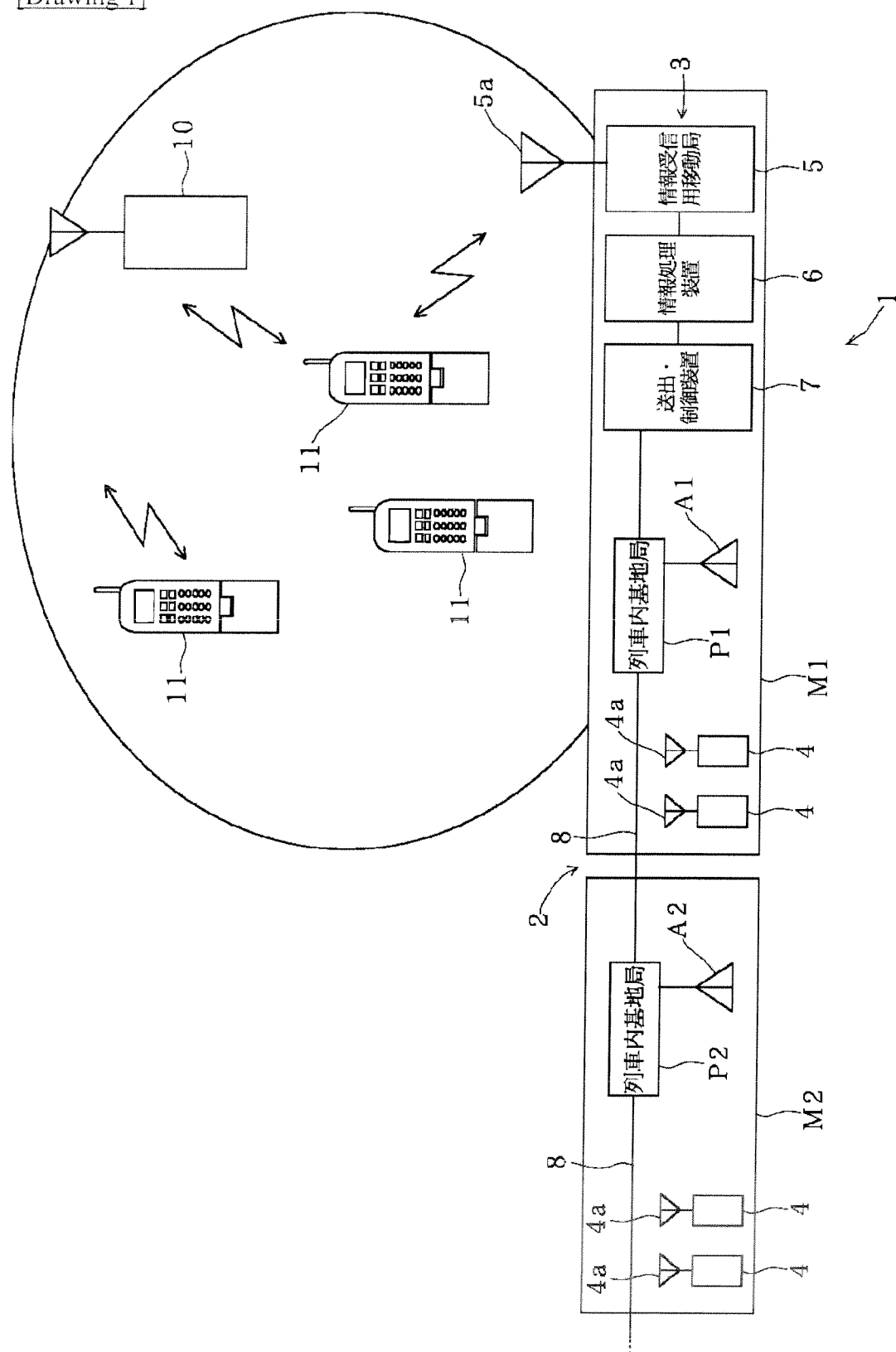
[Claim 2] The station base station which is installed in each station and transmits the station guidance information about each station concerned, such as a name of the station of each station concerned, to the train within predetermined distance by the wireless electric wave from the station concerned at least, The base station in a train of said train which is installed in each passenger car at least, and transmits a digital wireless electric wave, While outputting to the base station in said train as guidance information which is connected to the base station in said train, and consists train guidance information, such as an operation situation of said train, of text data The main base station outputted to the base station in said train as said guidance information which receives said station

guidance information by said wireless electric wave from said station base station, and consists of text data, While having a predetermined display, receiving a digital radio electric wave, changing that the wireless electric wave concerned is text data into text and carrying out a display output to said display While it has the radio telephone equipment in which the message which used said digital radio electric wave is possible and said main base station outputs said train guidance information to each [said] base station in a train as said guidance information which consists of said text data If said station guidance information by said wireless electric wave is received from said station base station The station guidance information concerned is outputted to each [said] base station in a train as said guidance information which consists of said text data. Each [said] base station in a train transmits the guidance information concerned into said passenger car by said wireless electric wave. Said radio telephone equipment in said passenger car receives said wireless electric wave of said guidance information transmitted from the base station in said train. It is the broadcast system in a train which changes the guidance information concerned into text and is displayed on said display. Said main base station The wireless electric wave outside a train of the same frequency band as said wireless electric wave which the base station in said train transmits is detected. Measure the field strength and the base station and link of said highest wireless electric wave outside a train of the field strength concerned are established. Said ID which the information receiving station outside a train which checks the ID, and said information receiving station outside a train checked is compared with ID of said station base station registered beforehand. If in agreement, receive the wireless electric wave outside a train concerned, acquire said station guidance information, and when said acquired ID is ID and the inequality of said station base station The broadcast system in a train characterized by having the control means which controls the output level of said wireless electric wave which the base station in said train transmits according to the field strength of said measured wireless electric wave outside a train.

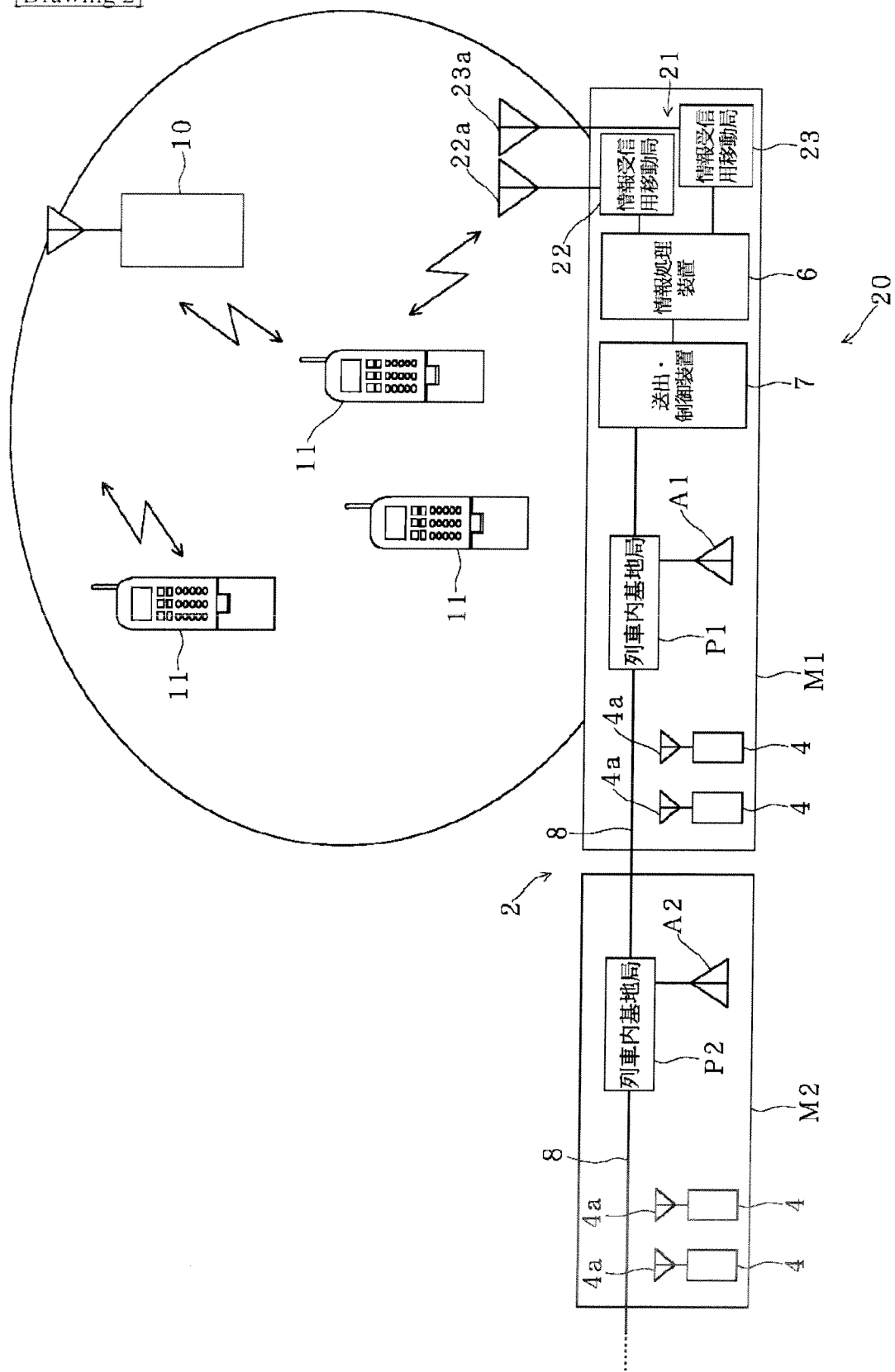
[Claim 3] For the frequency band of said wireless electric wave which the base station in said train transmits, said station base station is a broadcast system in a train according to claim 2 characterized by transmitting said station guidance information by the wireless electric wave of a different frequency band.

[Claim 4] Said information receiving station outside a train receives the wireless electric wave outside a train of two or more frequency bands, establishes the base station and link of the wireless electric wave outside a train concerned, and checks the ID. Said control means If in agreement as compared with ID of said station base station registered beforehand, the ID concerned Receive the wireless electric wave outside a train concerned, acquire said station guidance information, and when said ID of the wireless electric wave outside a train which received is ID and the inequality of said station base station The broadcast system in a train according to claim 2 or 3 characterized by controlling the output level of said wireless electric wave which the base station in said train transmits according to the field strength of said measured wireless electric wave outside a train.

[Drawing 1]



[Drawing 2]



[Drawing 3]

